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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

GREEN, TRACIE Y

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/565,809	Applicant(s) KIM ET AL.	
	Examiner TRACIE Y. GREEN	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4 and 19-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4 and 19-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>01/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The abstract of the disclosure is objected to because the abstract contains the following BaAl₂2019:Mn, BaAl₄023:Mn it is unclear as to what is intended by the applicant. Correction is required. See MPEP § 608.01(b).
3. The disclosure is objected to because of the following informalities: throughout the specification the following is noted, BaAl₂2019:Mn, BaAl₄023:Mn beginning on page 3, line 15 and continuing through the remainder of the disclosure. Some further examples include Y(Al, Ga)₅012:Tb which can be found on page 6 and forward. Appropriate correction is required.

Claim Objections

4. Claims 4, 19, 26, 30, and 31 are objected to because of the following informalities: Specifically, these claims contain the following BaAl₂2019:Mn, BaAl₄023:Mn and similar notations with other formulas, as stated above it is unclear as to what the applicant is intending to claim. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4 and 19-25, and 30-35 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the claim contains the following ;

Ba (Sr, Ma) AlO:Mn, the examiner is not familiar with a chemical whose abbreviation is "Ma", furthermore the specification is replete with this notation but does fails to describe the meaning for "Ma".

8. Claims 4 and 19-25, and 30-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically the claims contain the following: Ba (Sr, Ma) AlO:Mn, Ma is not disclosed in the periodic table and thus the claimed invention is not clear. For purposes of examination, the examiner will assume "Ma" should be "Mg" for Magnesium.

9. Claims 4, 26 and 30 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which

Art Unit: 2879

applicant regards as the invention. Specifically, these claims include the words "a prescribed number" which does not set forth any limitations following it. For purposes of examination, Examiner will assume any number of cells containing green, blue or red satisfies the limitation of "a prescribed number".

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claim 4, 19, 22, 23, and 26-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Haruki et al. (US 2001/0003410 A1).

Regarding claim 4, Haruki et al. (Haruki, hereafter) teaches (Figures 1 and 3) plasma display panel, comprising: a first substrate (1); a plurality of first electrodes (2a,2b) provided on the first substrate (1); a plurality of second electrodes (3a,3b) provided on the first substrate (1), the first (2) and second electrodes (3) being provided in a first direction; a second substrate (8); a plurality of address electrodes (10) provided on the second substrate (8) in a second direction, the first direction being different from the second direction; a plurality of barrier ribs (11) provided on the second substrate (8) in the second direction; a plurality of discharge cells (13), each cell provided between two adjacent barrier ribs (11), and having corresponding first (2), second (3) and address electrodes (11); a green phosphor (12) material provided to a first prescribed number of discharge cells; a red phosphor (12) material provided to a second

Art Unit: 2879

prescribed number of discharge cells; and a blue phosphor (12) material provided to a third prescribed number of discharge cells (13) (Paragraph 31, lines 11-14) wherein the green phosphor material comprises a first class phosphor material of $\text{Zn}_2\text{SiO}_4\text{:Mn}$, (Paragraph 57, lines 1-5) and at least one of a second class phosphor material or a third class phosphor material, the second class phosphor material comprising at least one of $\text{LaPO}_4\text{:Tb}$, $\text{Y}_3\text{Al}_3(\text{BO}_3)_4\text{Tb}$, $\text{Y}(\text{Al}, \text{Ga})_5\text{O}_{12}\text{:Tb}$, $\text{YBO}_3\text{:Tb}$, or $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$, (Paragraph 57, lines 1-5) and the third class phosphor material comprising at least one of $\text{BaAl}_{12}\text{O}_{19}\text{:Mn}$, $\text{BaAl}_{14}\text{O}_{23}\text{:Mn}$, or $\text{Ba}(\text{Sr}, \text{Ma})\text{AlO:Mn}$, and wherein the weight of the first class phosphor material to total weight is less than 100% (Paragraph 57, lines 1-5).

19. The plasma display panel of claim 4, wherein the second class phosphor material comprises $\text{Zn}_2\text{SiO}_4\text{:Mn}$, $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$, and the third class phosphor material comprises $\text{BaAl}_{12}\text{O}_{19}\text{:Mn}$ (Paragraph 48, lines 1-3).

Regarding claim 22, Haruki teaches wherein the second class phosphor to the first class phosphor is 25 ~80 wt % (Paragraph 48, lines 1-3).

Regarding claim 23, Haruki teaches wherein the second class phosphor to the first class phosphor is 25~80 wt % (Paragraph 57, lines 1-5).

Regarding claim 26, Haruki teaches (Figures 1 and 3) a plasma display panel, comprising: a first substrate (1); a plurality of first electrodes (2a, 2b) provided on the first substrate (1); a plurality of second electrodes (3a, 3b) provided on the first substrate (1), the first (2) and second electrodes (3) being provided in a first direction; a second substrate (8); a plurality of address electrodes (10) provided on the second substrate (8) in a second direction, the first direction being different from the second direction; a

Art Unit: 2879

plurality of barrier ribs (11) provided on the second substrate (8) in the second direction; a plurality of discharge cells(13), each cell provided between two adjacent barrier ribs (11), and having corresponding first (2), second (3) and address electrodes (11); a green phosphor (12) material provided to a first prescribed number of discharge cells; a red phosphor (12) material provided to a second prescribed number of discharge cells; and a blue phosphor (12) material provided to a third prescribed number of discharge cells (13) (Paragraph 31, lines 11-14) wherein the green phosphor material comprises a first class phosphor material of $\text{Zn}_2\text{SiO}_4\text{:Mn}$, (Paragraph 48, lines 1-5) and a second class phosphor material comprising at least one of $\text{LaPO}_4\text{:Tb}$, $\text{Y}_3\text{Al}_3(\text{BO}_3)_4\text{Tb}$, $\text{Y}(\text{Al}, \text{Ga})_5\text{O}_{12}\text{:Tb}$, $\text{YBO}_3\text{:Tb}$, or $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$ (Paragraph 48, lines 1-5).

Regarding claim 27, Haruki teaches, wherein the mixing rate of the second class phosphor to the first class phosphor is 25 ~50 wt % (Paragraph 48, lines 1-5).

Regarding claim 28, Haruki teaches wherein the green phosphor material comprises $\text{Zn}_2\text{SiO}_4\text{:Mn}$ and $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$ or $\text{Zn}_2\text{SiO}_4\text{:Mn}$ and $\text{Y}_3\text{Al}_3(\text{BO}_3)_4\text{Tb}$ (Paragraph 48, lines 1-5).

Regarding claim 29, Haruki teaches wherein $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$ and $\text{Y}_3\text{Al}_3(\text{BO}_3)_4\text{Tb}$.to total weight is 25 ~50 wt % (Paragraph 48, lines 1-5).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haruki et al. (US 2001/0003410 A1).

Regarding claims 24-25, Haruki does not explicitly teach a third phosphor comprising 1~25% of the green phosphor compound. However, in paragraphs 15-16, Haruki discloses that the $\text{ReBO}_3\text{:Tb}$, (where Rare earth element) serves a phosphor with a positive polarity and should be in a mixed portion from 10%-75% (Paragraph 17, lines 1-2) in order to reduce discharge variation or discharge error within the plasma display (Paragraph 14, lines 1-3).

Thus one of ordinary skill in the art at the time of the invention could modify the plasma display Haruki with a third phosphor comprising 1~25% of the green phosphor compound in order to reduce discharge variation or discharge error within the plasma display as taught by Haruki.

14. Claims 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haruki et al. (US 2001/0003410 A1) in view of Kawamura (US 2002/0195938 A1).

Regarding claim 30, Haruki teaches (Figures 1 and 3) a plasma display panel, comprising: a first substrate (1); a plurality of first electrodes (2a,2b) provided on the first substrate (1); a plurality of second electrodes (3a,3b) provided on the first substrate (1), the first (2) and second electrodes (3) being provided in a first direction; a second substrate (8); a plurality of address electrodes (10) provided on the second substrate (8) in a second direction, the first direction being different from the second direction; a plurality of barrier ribs (11) provided on the second substrate (8) in the second direction; a plurality of discharge cells(13), each cell provided between two adjacent barrier ribs

Art Unit: 2879

(11), and having corresponding first (2), second (3) and address electrodes (11); a green phosphor (12) material provided to a first prescribed number of discharge cells; a red phosphor (12) material provided to a second prescribed number of discharge cells; and a blue phosphor (12) material provided to a third prescribed number of discharge cells (13) (Paragraph 31, lines 11-14) wherein the green phosphor material comprises a first class phosphor material of $\text{Zn}_2\text{SiO}_4\text{:Mn}$, (Paragraph 48, lines 1-5) and a second class phosphor material comprising at least one of $\text{LaPO}_4\text{:Tb}$, $\text{Y}_3\text{Al}_3(\text{BO}_3)_4\text{Tb}$, $\text{Y}(\text{Al}, \text{Ga})_5\text{O}_{12}\text{:Tb}$, $\text{YBO}_3\text{:Tb}$, or $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$ (Paragraph 48, lines 1-5), or at least one of $\text{BaAl}_{12}\text{O}_{19}\text{:Mn}$, $\text{BaAl}_{14}\text{O}_{23}\text{:Mn}$, or $\text{Ba}(\text{Sr}, \text{Ma})\text{AlO:Mn}$ (Paragraph 57, lines 1-5).

Haruki is silent regarding a green phosphor compound with a first class phosphor, a second class phosphor and a third class phosphor.

In the same field of endeavor of plasma display, Kawamura discloses a green phosphor compound with a first class phosphor ($\text{Zn}_2\text{SiO}_4\text{:Mn}$,) (Column 5, lines 50-55), a second class phosphor $(\text{Y}, \text{Gd})\text{BO}_3\text{:Tb}$ (Column 4, lines 20-25) and a third class phosphor ($\text{BaAl}_{14}\text{O}_{23}\text{:Mn}$) (Column 3, lines 35-40) in order to increase the luminance efficiency of the green material without increasing drive voltage (Column 5, lines 40-45).

Therefore one of ordinary skill in the art at the time of the invention could modify the plasma display of Haruki with the green phosphor compound containing a first class phosphor, a second class phosphor and a third class phosphor in order to increase the luminance efficiency of the green material without increasing drive voltage as taught by Kawamura.

Art Unit: 2879

Regarding claim 31, Haruki teaches wherein the second class phosphor material comprises (Y, Gd)BO₃:Tb or Y₃Al₃(BO₃)₄Tb (Paragraph 57, lines 1-4); and the third class phosphor material comprises BaAl₁₂O₁₉: Mn (Paragraph 57, lines 5-7).

Regarding claims 32-33, Haruki does not explicitly teach a third phosphor comprising 1~25% of the green phosphor compound. However, in paragraphs 15-16, Haruki discloses that the ReBO₃:Tb, (where Rare earth element) serves a phosphor with a positive polarity and should be in a mixed portion from 10%-75% (Paragraph 17, lines 1-2) in order to reduce discharge variation or discharge error within the plasma display (Paragraph 14, lines 1-3). Kawamura teaches a three compound phosphor with 5% of the first class phosphor in order to increase the luminance efficiency (Column 5, lines 40-46) in order to increase the luminance efficiency of the green material without increasing drive voltage.

Thus one of ordinary skill in the art at the time of the invention could modify the plasma display Haruki with a third phosphor comprising 1~25% of the green phosphor compound in order to reduce discharge variation or discharge error within the plasma display as taught by Haruki, as well as to increase the luminance efficiency of the green material without increasing drive voltage as disclosed by Kawamura.

Regarding claim 34, Haruki teaches wherein the second class phosphor to the first class phosphor is 25 ~80 wt % (Paragraph 48, lines 1-3).

Regarding claim 35, Haruki teaches wherein the second class phosphor to the first class phosphor is 25~80 wt % (Paragraph 57, lines 1-5).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure can be found in form 892 of this office action. US 2003/017342 discloses first, second and third class phosphors of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TRACIE Y. GREEN whose telephone number is (571)270-3104. The examiner can normally be reached on Monday-Thursday, 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571/272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tracie Y Green/
Examiner, Art Unit 2879

/Sikha Roy/
Primary Examiner, Art Unit 2879